

Claims

- [c1] An apparatus for reclamation of material used in an integrated circuit plasma process chamber, the apparatus comprising: a first separator receiving plasma-enhanced exhaust from a process chamber, the first separator including a plurality of temperature zones, each temperature zone including a temperature control device and a collection vessel for collecting material that condenses in the respective temperature zone.
- [c2] The apparatus of claim 1, wherein each temperature zone has a lower temperature than a preceding temperature zone.
- [c3] The apparatus of claim 1, further comprising a baffle between each temperature zone.
- [c4] The apparatus of claim 1, further comprising a material processing unit coupled to an outlet of each collection vessel.
- [c5] The apparatus of claim 4, wherein each material processing unit includes:
a disposal unit for disposing of material that is un reusable;
a reservoir for holding material that is reusable; and
a directing valve for directing material to one of the disposal unit and the reservoir.
- [c6] The apparatus of claim 5, wherein each material processing

unit further includes a second separator, the second separator including at least one secondary temperature zone having a temperature different than a respective preceding temperature zone of the first separator.

wherein each secondary temperature zone includes a secondary collection vessel for collecting material that condenses in the respective secondary temperature zone, and wherein the directing valve directs material to one of the disposal unit, the reservoir and the second separator.

[c7] The apparatus of claim 4, further comprising a material reuse unit coupled to each material processing unit.

[c8] The apparatus of claim 7, wherein the material reuse unit includes:
a mixing chamber for receiving material from at least one reservoir, the mixing chamber coupled to the plasma process chamber; and
an injector coupled to each reservoir for selectively communicating material from a respective reservoir to the mixing chamber.

[c9] The apparatus of claim 8, further comprising a non-reclaimed material supply coupled to the mixing chamber.

[c10] The apparatus of claim 9, further comprising a priming device for inserting non-reclaimed material from the non-reclaimed

material supply into the reservoir.

[c11] The apparatus of claim 1, further comprising a chemical reactive separator for receiving the plasma-enhanced exhaust prior to the first separator and separating chemically reactive material from the plasma-enhanced exhaust.

[c12] The apparatus of claim 1, further comprising a regeneration device for using heat generated by the first separator.

[c13] An integrated circuit plasma processing system comprising:
a process chamber for carrying out plasma-enhanced processing on a wafer; and
a reclamation system including:
a first separator receiving plasma-enhanced exhaust from the process chamber, the first separator including a plurality of temperature zones, each temperature zone including a collection vessel for collecting material that condenses in the respective temperature zone;
a material processing unit coupled to an outlet of each collection vessel; and
a material reuse unit coupled to each material processing unit.

[c14] The apparatus of claim 13, wherein each temperature zone has a lower temperature than a preceding temperature zone.

[c15] The apparatus of claim 13, wherein each material processing unit includes:

a disposal unit for disposing of unwanted material;
a reservoir for holding wanted material; and
a directing valve for directing material to one of the disposal unit and the reservoir.

[c16] The apparatus of claim 15, wherein each material processing unit further includes a second separator, the second separator including at least one secondary temperature zone having a temperature different than a respective preceding temperature zone of the first separator,
wherein each secondary temperature zone includes a secondary collection vessel for collecting material that condenses in the respective secondary temperature zone, and
wherein the directing valve directs material to one of the disposal unit, the reservoir and the second separator.

[c17] The apparatus of claim 13, wherein the material reuse unit includes:
a mixing chamber for receiving material from at least one reservoir, the mixing chamber coupled to the process chamber;
an injector coupled to each reservoir for selectively communicating material from a respective reservoir to the mixing chamber; and
a non-reclaimed material supply coupled to the mixing chamber.

- [c18] The apparatus of claim 13, further comprising a chemical reactive separator for receiving exhaust prior to the first separator and separating chemically reactive material from the exhaust.
- [c19] A method of reclaiming material used in integrated circuit plasma processing, the method comprising the steps of: exposing plasma-enhanced exhaust from a process chamber to a plurality of temperature zones, each temperature zone having a lower temperature than a preceding temperature zone; and collecting material that condenses in each respective temperature zone.
- [c20] The method of claim 19, further comprising reusing the collected material.